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GENALIGN - Multiple Sequence Alignment Program
Release 5.4

Thu 6 Apr 106 9:54:42-PST

Solution Parameters:

    Nucleic Alphabet   = Identity
    Output line length = 80
    Compress           = Off
    Histogram          = Off
    Randomization      = Off

    AMINO-Res-length   = 2
    DELetion-weight    = 5.00
    LEngth-factor      = 0
    Matching-weight    = 1.00
    NUCLEIC-Res-length = 4
    SPread-factor      = 50

Clustered order of selected sequences:

 4. US-10-659-983A-4    (1-1460)
 3. US-10-659-983A-3    (1-1458)
 1. US-10-659-983A-1    (1-1457)
 2. US-10-659-983A-2    (1-1457)
 5. US-10-659-983A-18   (1-1467)
 7. US-10-659-983A-20   (1-1491)
 6. US-10-659-983A-19   (1-1494)

Region Alignment: (listed in Clustered order)
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US-10-659-   1        ATTGAACGCTGGCGGCCATGCTTTACACATGCAAGTCGAACGGC
                      |||||||||||||||||||||||||||||||||||||||||||||
US-10-659-   1        ATTGAACGCTGGCGGCCATGCTTTACACATGCAAGTCGAACGGC
                      |||||||||||||||||||||||||||||||||||||||||||||
US-10-659-   1        ATTGAACGCTGGCGGCCATGCTTTACACATGCAAGTCGAACGGC
                      |||||||||||||||||||||||||||||||||||||||||||||
US-10-659-   1        ATTGAACGCTGGCGGCCATGCTTTACACATGCAAGTCGAACGGC
                      |||||||||||||||||||||||||||||||||||||||||||||
US-10-659-   1        ATTGAACGCTGGCGGCCATGCTTTACACATGCAAGTCGAACGGC
                      |||||||||||||||||||||||||||||||||||||||||||||
US-10-659-   1    TTGATCATGGCTCAGATTGAACGCTGGCGGCCATGCTTTACACATGCAAGTCGAACGGC
                      |||||||||||||||||||||||||||||||||||||||||||||
US-10-659-   1   GTTTGATCATGGCTCAGATTGAACGCTGGCGGCCATGCTTTACACATGCAAGTCGAACGGC
                      |||||||||||||||||||||||||||||||||||||||||||||
US-10-659-   1  aGTTTGATCATGGCTCAGATTGAACGCTGGCGGCCATGCTTTACACATGCAAGTCGAACGGC
                      |||||||||||||||||||||||||||||||||||||||||||||
consensus        agtttgatcatggctcagattgaacgctggcggccatgctttacacatgcaagtcgaacggc

US-10-659-  44   AGCGgGG   GcttcggCCTGcccGGCGGCGAGTGGCGAACGGGTGAGTAATACATCGGAACGTgT
                    |||||            ||||||||||||||||||||||||||||||||||||||||||
US-10-659-  44   AGCACGG   GggcaacCCTGGTGGCGAGTGGCGAACGGGTGAGTAATACATCGGAACGTAT
                    |||||||            |||||||||||||||||||||||||||||||||||||||
US-10-659-  44   AGCACCGATGCTTGCATCTGGTGCGGGAGTGGCGAGTGGCGAACGGGTGAGTAATACATCGGAACGTAT
US-10-659-  44   AGCACGGATGCTTGCATCTGGTGCGGGAGTGGCGAGTGGCGAACGGGTGAGTAATACATCGGAACGTGT
US-10-659-  59   AGCACGGGGT
US-10-659-  61   AGCACGGGGTGCTTGCACCTGGTGGCGAGTGGCGAACGGGTGAGTAATGCATCGGAACGTGT
US-10-659-  62   AGCACGGGGTGCTTGCACCTGGTGGCGAGTGGCGAGTGGCGAACGGGTGAGTAATGCATCGGAACGTGT
consensus        AGCacGGgtGcttgcacCTGgtgGCGAGTGGCGAaCGGGTGAGTAATgCATCGGAACGTgT

US-10-659- 103   CCttaAGTGGGGaATAACGCAtcCGAAAGaTGTGCTAATACCGCATA TCTTCtgaGGAGAAA
                   || |||  ||||  |||| ||||| ||||| |||||||||||||||| |||| ||||||||
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US-10-659- 103  CtTCgAGGGGGGATAACGCAcCGAAAGgTGTGCTAATaTCCGCATAaTCTTCaCGGAGAAA
                  |||     |||||||||||||||  ||||||||||||||  |||||||||| ||||||||
US-10-659- 105  CCAGAAGAGAGGGGGTAACGGGTAACGCATCGAAAGATGTGCTAATACCGCATAACTTCTAAGAGGAA
US-10-659- 105  CCAGAAGAGAGGGGGTAACGGGTAACGCATCGAAAGATGTGCTAATACCGCATAACTTCTAAGAGGAA
US-10-659- 120  CCAGAAGTGGGGGATAACGCATCGAAAGATGTGCTAATACCGCATATTCTTCACGGAGGAA
US-10-659- 122  CCAGAAGTGGGGGATAACGCATCGAAAGATGTGCTAATACCGCATATTCTTCTACGGAGGAA
US-10-659- 123  CCggAAGTGGGGGATAACGCATCGAAAGATGTGCTAATACCGCATAttCTCtacGGAGGAA
                  |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
consensus       CcagaAgtGGGGgaTAACGCAtCGAAAGaTGTGCTAATACCGCATAttCTCtacGGAGGAA

US-10-659- 163  AGCAGGGGATCGCAAGACCTTGCGCTaaaGGAGCGGCCGATGTCTGATTAGCTAGTTGGTG
US-10-659- 164  AGCAGGGGATCGCAAGACCTTGCGCTcTTGGAGCGGCCGATGTCTGATTAGCTAGTTGGTG
US-10-659- 166  AGCAGGGGATCGAAAGACCTTGCGCTTTGGAGCGGCCGATGTCTGATTAGCTAGTTGGTG
US-10-659- 166  AGCAGGGGATCGAAAGACCTTGCGCTTTGGAGCGGCCGATGTCTGATTAGCTAGTTGGTG
US-10-659- 181  AGCAGGGGATCGAAAGACCTTGCGCTTTGGAGCGGCCGATGTCTGATTAGCTAGTTGGTG
US-10-659- 183  AGCAGGGGATCGAAAGACCTTGTGCTTTGGAGCGGCCGATGCCTGATTAGCTAGTTGGTG
US-10-659- 184  AGCAGGGGATCGAAAGACCTTGTGCTTTGGAGCGGCCGATGCCTGATTAGCTAGTTGGTG
consensus       AGCAGGGGATCGaAAGACCTTGcGCTtttGGAGCGGCCGATGtCTGATTAGCTAGTTGGTG

US-10-659- 224  gGGTAAaGGCTTACCAAGGCaACGATCAGTAGTcAGTcAGTTCGTCTGAGAGGACGACCAaCCACACTG
US-10-659- 225  aGGTAAtGGCTTACCAAGGCGACGATCAGTAGTCAGTAGTTCGTCTGAGAGACGACCAGCCACACTG
US-10-659- 227  GGGTAAAGGCCTACCAAGGCGACGATCAGTAGTTCGTCTGAGAGGACGACCAGCCACACTG
US-10-659- 227  GGGTAAAGGCCTACCAAGGCGACGATCAGTAGTTCGTCTGAGAGGACGACCAGCCACACTG
US-10-659- 242  GGGTAAAGGCCTACCAAGGCaACGATCAGTAGTTCGTCTGAGAGGACGACCAGCCACACTG
US-10-659- 244  GGGTAAAGGCCTACCAAGGCaACGATCAGTAGTTCGTCTGAGAGGACGACCAGCCACACTG
US-10-659- 245  gGGTAAaGGCTTACCAAGGCaACGATCAGTAGTcAGTtCGTCTGAGAGGACGACCAgCCACACTG
consensus       gGGTAAaGGCTTACCAAGGCaACGATCAGTAGTcAGTtctCGTCTGAGAGGACGACCAgCCACACTG

US-10-659- 285  GGACTGAGACACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGGAATTTTGGACAATGGGc
US-10-659- 286  GGACTGAGACACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGGAATTTTGGACAATGGGg
US-10-659- 288  GGACTGAGACACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGGAATTTTGGACAATGGGC
US-10-659- 288  GGACTGAGACACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGGAATTTTGGACAATGGGC
US-10-659- 303  GGACTGAGACACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGGAATTTTGGACAATGGGC
US-10-659- 305  GGACTGAGACACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGGAATTTTGGACAATGGGC
US-10-659- 306  GGACTGAGACACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGGAATTTTGGACAACGGGC
consensus       GGACTGAGACACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGGAATTTTGGACAAtGGGc

US-10-659- 346  GAAAgCCTGATCCAGCCATGCCGCGTGAGTGAAGAAGGCC   TTCGGGTTGTAgAGCTCTTT
US-10-659- 347  GAAACCCTGATCCAGCCATGCCGCGTGAGTGAAGAAGGCC   TTCGGGTTGTAAAGCTCTTT
US-10-659- 349  GCAAGCCTGATCCAGCAATGCCGCGTGAGTGAAGAAGGCC   TTCGGGTTGTAAAGCTCTTT
US-10-659- 349  GCAAGCCTGATCCAGCAATGCCGCGTGAGTGAAGAAGGCC   TTCGGGTTGTAAAGCTCTTT
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US-10-659-   610   CCTGGGAATTGCGTTTGAAACTACAAGCTAGAGTGTAGCAGAGGGGGTGGAATTCCATG
consensus   CCTGGGAAtTGCGTTTGAAACTACAAGCTAGAGTGtaGCAGAGGGgGgTGGAATTCCAtG

US-10-659-   650   TGTAGCAGTGAAATGCGTAGAGATGTGAAGAACACCGATGGCGAAGGCAGCtCCCTGGGT
US-10-659-   651   TGTAGCAGTGAAATGCGTAGAGATGTGAAGAACACCGATGGCGAAGGCAGCCCCCTGGGT
US-10-659-   653   TGTAGCAGTGAAATGCGTAGAGATGTGAagGAACAACATCGATGGCGAAGGCAGCCTCCTGGGT
US-10-659-   653   TGTAGCAGTGAAATGCGTAGAGATATGGAAGAACAACATCGATGGCGAAGGCAGCCCCCTGGGT
US-10-659-   667   TGTAGCAGTGAAATGCGTAGAGATATGGAAGAACAACATCGATGGCGAAGGCAGCCCCCTGGGT
US-10-659-   670   TGTAGCAGTGAAATGCGTAGAGATATGGAAGAACAACATCGATGGCGAAGGCAGCCCCCTGGGT
US-10-659-   671   TGTAGCAGTGAAATGCGTAGAGATATGGAAGAACAACATCGATGGCGAAGGCAGCCCCCTGGGT
consensus   TGTAGCAGTGAAATGCGTAGAGATaTGGAaGAACaACtCGATGGCGAAGGCAGCccCCTGGGT

US-10-659-   711   TgACACtGACGCTCAtgCACGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTC
US-10-659-   712   TAACAcCGACGCTCAGgCGCACGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTC
US-10-659-   714   TAACACTGACGCTCATGCACGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGTAGTC
US-10-659-   714   TAACACTGACGCTCATGCACGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGTAGTC
US-10-659-   728   TAACACTGACGCTCATGCACGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTTGTAGTC
US-10-659-   731   TAACACTGACGCTCATGCACGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGTAGTC
US-10-659-   732   TAACACTGACGCTCATGCACGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGTAGTC
consensus   TaACACtGACGCTCAtgCACGAAAGCGTGGGGAGCAAACAGGATTAGATACCCTGGTAGTC

US-10-659-   772   CACGCCCTAAACGATGTCAACTgGTTGTCCGatcTaaTcAaGGaCttGGTaACGtAGCTAGCTAA
US-10-659-   773   CACGCCCTAAACGATGTCAACTAGTTGTCGG
US-10-659-   775   CACGCCCTAAACGATGTCAACTAGTTGTTGG
US-10-659-   775   CACGCCCTAAACGATGTCAACTAGTTGTTGG
US-10-659-   789   CACGCCCTAAACGATGTCAACTAGTTGTTGG
US-10-659-   792   CACGCCCTAAACGATGTCAACTAGTTGTTGG
US-10-659-   793   CACGCCCTAAACGATGTCAACTAGTTGTTGG
consensus   CACGCCCTAAACGATGTCAACTagTTGTLGGatgcctTactaGgcTGGTaACGtTGGTaACGgAATTGACGG

US-10-659-   833   CGCGTGAAGTTGaCCGCCCGTCGGGGAGTACGGTCGCAAGGATTAAAACTCAAAGGAATTGACGG
US-10-659-   832   CGCGTGAAGTTGgCCGCCCGTCGGGGAGTACGGTCGCAAGGATTAAAACTCAAAGGAATTGACGG
US-10-659-   834   CGCGTGAAGTTGaCCGCCCGTCGGGGAGTACGGTCGCAAGGATTAAAACTCAAAGGAATTGACGG
US-10-659-   834   CGCGTGAAGTTGaCCGCCCGTCGGGGAGTACGGTCGCAAGGATTAAAACTCAAAGGAATTGACGG
US-10-659-   848   CGCGTGAAGTTGaCCGCCCGTCGGGGAGTACGGTCGCAggGATTAAAACTCAAAGGAATTGACGG
US-10-659-   851   CGCGTGAAGTTGaCCGCCCGTCGGGGAGTACGGTCGCAAGGATTAAAACTCAAAGGAATTGACGG
US-10-659-   852   CGCGTGAAGTTGaCCGCCCGTCGGGGAGTACGGTCGCAagGATTAAAACTCAAAGGAATTGACGG
consensus   CGCGTGAAGTTGaCCGCCCGTCGGGGAGTACGGTCGCAaGATTAAAACTCAAAGGAATTGACGG

US-10-659-   364   GAAAGCCTGATCCAGCAATGCCGCGTGAGTGAAGAAGC
US-10-659-   366   GAAAGCCTGATCCAGCAATGCCGCGTGAGTGAAGAAGG
US-10-659-   367   GAAAGCCTGATCCAGCAATGCCGCGTGAGTGAAGAAGG
consensus   GaAAgCCTGATCCAGCAATGCCGCGTGAGTGAAGAAGG

US-10-659-   406   tAGtCagAAagAAagaaTCAtgatgaAATaattaTGAtTtaTGACGGTACtGacAGAaaAAG
US-10-659-   407   CAGcCGGAAcGAAacGGTCACGGGctAATAccCGTGACTacTGACGGTATCGACAGAGAAG
US-10-659-   409   CAGTCGAGAGAGAAAAGGTTACGGTAAAATAATCGTGACTACCATGACGGTATCGACAGAGAAG
US-10-659-   409   CAGTCGAGAGAGAAAAGGTTACGGTAAAATAATCGTGACCCATGACGGTATCGACAGAGAAG
US-10-659-   423   CAGTCGAGAGAGAAAAGGTTGTGACTAATAATCACAACTTATGACGGTACCGACAGAGAAG
US-10-659-   426   CAGTCGAGAGAGAAAAGGTTGTGACTAATAATCACAACTTATGACGGTACCGACAGAGAAG
US-10-659-   427   CAGTCGAGAGAGAAAAGGTTGTGACTAATAATCACAACTTATGACGGTACCGACAGAGAAG
consensus   cAGtCgagAGAaGAAAggtTtatGactAATAAtcatgActtaTGACGGTAccGacAGAGAAG

US-10-659-   467   CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCGaGCGTTAATCGGAAT
US-10-659-   468   CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCGCAAGCGTTAATCGGAAT
US-10-659-   470   CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCGCAAGCGTTAATCGGAAT
US-10-659-   470   CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCGCAAGCGTTAATCGGAAT
US-10-659-   484   CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCGCAAGCGTTAATCGGAAT
US-10-659-   487   CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCGCAAGCGTTAATCGGAAT
US-10-659-   488   CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCGCAAGCGTTAATCGGAAT
consensus   CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCGCaAGCGTTAATCGGAAT

US-10-659-   528   TACTGGGCGTAAAGgGTGCGCAGGCGGGTTTTGTAAGTCAGATGTGAAAGCCCCCGGGCTTAA
US-10-659-   529   TACTGGGCGTAAAGGGTGCGCAGGCGGGCTTTGTAAGTCAGATGTGAAAGCCCCCGGGCTTAA
US-10-659-   531   TACTGGGCGTAAAGGGTGCGCAGGCGGGCCtTTGTAAGTCAGATGTGAAATCCCCCGGGCTTAA
US-10-659-   531   TACTGGGCGTAAAGGGTGCGCAGGCGGGCTTTGTAAGTCAGATGTGAAATCCCCCGGGCTTAA
US-10-659-   545   TACTGGGCGTAAAGGGTGCGCAGGCGGGCTTTGTAAGTCAGATGTGAAATCCCCCGGGCTTAA
US-10-659-   548   TACTGGGCGTAAAGGGTGCGCAGGCGGGCTTTGTAAGTCAGATGTGAAATCCCCCGGGCTTAA
US-10-659-   549   TACTGGGCGTAAAGgGTGCGCAGGCGGGctTTGTAAGTCAGATGTGAAAtCCCCCGGGCTTAA
consensus   TACTGGGCGTAAAGgGTGCGCAGGCGGGCTTTGTAAGTCAGATGTGAAAtCCCCCGGGCTTAA

US-10-659-   589   CCTGGGAACTGCGTTTGAAACTACAAGGCTcaGCAGAGGGGaTGGAATTCCAtG
US-10-659-   590   CCTGGGAAcTGCGTTTGAAACTACAAGGCTAGAGTGTGGCAGAGGGGGTGGAATTCCACG
US-10-659-   592   CCTGGGAATTGCGTTTGAAACTACAAGGCTAGAGTGTGGCAGAGGGGGTGGAATTCCATG
US-10-659-   592   CCTGGGAATTGCGTTTGAAACTACAAGGCTAGAGTGTGGCAGAGGGGGTGGAATTCCATG
US-10-659-   606   CCTGGGAATTGCGTTTGAAACTACAAGGCTAGAGTGTAGCAGAGGGGGTGGAATTCCATG
US-10-659-   609   CCTGGGAATTGCGTTTGAAACTACAAGGCTAGAGTGTAGCAGAGGGGGTGGAATTCCATG

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US-10-659-  894  GGACCCGCACAAGCGGTGGATTATGTGGATTAATTCGATGCAACGGAAAAACCTTACCTA
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659-  893  GGACCCGCACAAGCGGTGGATTATGTGGATTAATTCGATGCAACGGAAAAACCTTACCTA
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659-  895  GGACCCGCACAAGCGGTGGATTATGTGGATTAATTCGATGCAACGGAAAAACCTTACCTA
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659-  895  GGACCCGCACAAGCGGTGGATTATGTGGATTAATTCGATGCAACGGAAAAACCTTACCTA
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659-  909  GGACCCGCACAAGCGGTGGATTATGTGGATTAATTCGATGCAACGGAAAAACCTTACCTA
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659-  912  GGACCCGCACAAGCGGTGGATTATGTGGATTAATTCGATGCAACGGAAAAACCTTACCTA
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659-  913  GGACCCGCACAAGCGGTGGATTATGTGGATTAATTCGATGCAACGGAAAAACCTTACCTA
consensus        GGACCCGCACAAGCGGTGGATTATGTGGATTAATTCGATGCAACGGAAAAACCTTACCTA

US-10-659-  955  CCCTTGACATGCttggGAAtCtaGtgGAGacaTaaGaGTG  CCCGAAAGGGAGCcaagACAC
                  ||||||||||||||  |||| ||| || ||| || || |||  |||||||||||||
US-10-659-  954  CCCTTGACATGTACCGAAgCCcGCcGCGAGAggTggGtGTG  CCCGAAAGGGAGCGcgTAACAC
                  ||||||||||    ||| || |  |  || ||  |  | |||  ||||||||||||
US-10-659-  956  CCCTTGACATGCttggGAATTTTCTAGAGATTAGTTAGTG  C   TTCGGGAACGTAACAC
                  ||||||||||| ||  |||||||||||||||||||||||  |   ||||||||||||||
US-10-659-  956  CCCTTGACATGCttggGAATTTTCTAGAGATTAGTTAGTG  C   TTCGGGAACGTAACAC
                  ||||||||||| ||  |||||||||||||||||||||||  |   ||||||||||||||
US-10-659-  970  CCCTTGACATGCttggGAATATTTTTAGAGATAAAATAGTGCC      TTCGGGAACGCTAACAC
                  ||||||||||| ||  |||||||||||||||||||||||||||      |||||||||||||||
US-10-659-  973  CCCTTGACATGCttggGAATATTTTTAGAGATAAAATAGTGCC      TTCGGGAACGTAACAC
                  ||||||||||| ||  |||||||||||||||||||||||||||      |||||||||||||||
US-10-659-  974  CCCTTGACATGtagcGGAAtcatttaGAGAtaaaatagTGCccgttcGGGAacGctaaCAC
consensus        CCCTTGACATGtagcGGAAtcatttaGAGAtaaaatagTGCccgttcGGGAacGctaaCAC

US-10-659- 1015  AGGTGCTGCATGGCTGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG
                  |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659- 1014  AGGTGCTGCATGGCTGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG
                  |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659- 1013  AGGTGCTGCATGGCTGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG
                  |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659- 1013  AGGTGCTGCATGGCTGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG
                  |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659- 1028  AGGTGCTGCATGGCTGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG
                  |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659- 1031  AGGTGCTGCATGGCTGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG
                  |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659- 1032  AGGTGCTGCATGGCTGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG
consensus        AGGTGCTGCATGGCTGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG

US-10-659- 1076  CGCAACCCCTGTCACtAAtTGCCATCATTCtAaaTGaGaCACTTTAgTGAgACTGCCGGTGA
                  |||||||||||||   | ||||||||||||  |  | | |||||| |||| ||||||||||||
US-10-659- 1075  CGCAACCCCTGTCATTAATTGCCATCATTC  AGTTGGGCACTTTAatGAaACTGCCGGTGA
                  |||||||||||||||||||||||||||||  ||||||||||||||  ||| ||||||||||||
US-10-659- 1074  CGCAACCCCTGTCATTAATTGCCATCATT   TGGTTGGGCACTTTAATGAGACTGCCGGTGA
                  |||||||||||||||||||||||||||||   |||||||||||||||||||||||||||||||
US-10-659- 1074  CGCAACCCCTGTCATTAATTGCCATCATT   TGGTTGGGCACTTTAATGAGACTGCCGGTGA
                  |||||||||||||||||||||||||||||   |||||||||||||||||||||||||||||||
US-10-659- 1089  CGCAACCCCTGTCATTAATTGCCATCATT   TAGTTGGGCACTTTAATGAGACTGCCGGTGA
                  |||||||||||||||||||||||||||||   |||||||||||||||||||||||||||||||
US-10-659- 1092  CGCAACCCCTGTCATTAATTGCCATCATT   TAGTTGGGCACTTTAATGAGACTGCCGGTGA
                  |||||||||||||||||||||||||||||   |||||||||||||||||||||||||||||||
US-10-659- 1093  CGCAACCCCTGTCAtTAATTGCAtTAATTGctagtTGgGCACTTTctagtGAgACTGCCGGTGA
consensus        CGCAACCCCTGTCAtTAATTGCAtTAATTGctagtTGgGCACTTTctagtGAgACTGCCGGTGA

US-10-659- 1137  CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659- 1135  CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659- 1134  CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
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US-10-659- 1134  CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659- 1149  CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659- 1152  CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659- 1153  CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
consensus        CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC

US-10-659- 1198  ACGTAATACAATGGGCGCGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCCAATCTCAGAAA
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659- 1196  ACGTAATACAATGGGCGCGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCTAATCTCAGAAA
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659- 1195  ACGTAATACAATGGGCGCGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCTAATCTCAGAAA
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659- 1195  ACGTAATACAATGGGCGCGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCTAATCTCAGAAA
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US-10-659- 1210  ACGTAATACAATGGGCGCGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCTAATCTCAGAAA
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US-10-659- 1213  ACGTAATACAATGGGCGCGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCTAATCTCAGAAA
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US-10-659- 1214  ACGTAATACAATGGGCGCGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCTAATCTCAGAAA
consensus        ACGTAATACAATGGGCGCGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCTAATCTCAGAAA

US-10-659- 1259  GCaCGTCGTAGTCCGGATCCGAGTCTGCAACTCGACTCGCGAAGTCGGAATCGCTAGTAA
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US-10-659- 1257  GCGCGTCGTAGTCCGGATCCGAGTCTGCAACTCGACTCGCGAAGTCGGAATCGCTAGTAA
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US-10-659- 1256  GCGCGTCGTAGTCCGGATCCGAGTCTGCAACTCGACTCGCGAAGTCGGAATCGCTAGTAA
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US-10-659- 1256  GCGCGTCGTAGTCCGGATCCGAGTCTGCAACTCGACTCGCGAAGTCGGAATCGCTAGTAA
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US-10-659- 1271  GCGCGTCGTAGTCCGGATCCGAGTCTGCAACTCGACTCGCGAAGTCGGAATCGCTAGTAA
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US-10-659- 1274  GCGCGTCGTAGTCCGGATCCGAGTCTGCAACTCGACTCGCGAAGTCGGAATCGCTAGTAA
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US-10-659- 1275  GCGCGTCGTAGTCCGGATCCGAGTCtaGCAACTCGACTCGCGAAGTCGGAATCGCTAGTAA
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consensus        GCGCGTCGTAGTCCGGATCCGAGTCTGCAACTCGACTCGCGAAGTCGGAATCGCTAGTAA

US-10-659- 1320  TCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACAC
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US-10-659- 1318  TCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACAC
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US-10-659- 1317  TCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACAC
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US-10-659- 1332  TCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACAC
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US-10-659- 1335  TCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACAC
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US-10-659- 1336  TCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACAC
consensus        TCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACAC

US-10-659- 1381  CATGGGAGTTGGtTTTCACCAGAAGCAGGTAGTTtAACCGtAAGGAGGAcGCTTGCCACGGT
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US-10-659- 1378  CATGGGAGTTGGGTTTCACCAGAAGCAGGTAGTTTAACCGTAAGGAGGACGCTTGCCACGGT
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US-10-659- 1378  CATGGGAGTTGGGTTTCACCAGAAGCAGGTAGTTTAACCGTAAGGAGGACGCTTGCCACGGT
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US-10-659- 1393  CATGGGAGTTGGGTTTCACCAGAAGCAGATAGTTCTAACCGTAAG  AGGGCGTTTGCCACGGc
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US-10-659- 1396  CATGGGAGTGGGTTTCACCAGAGAAGCAGATAGTCTAACCGTAAGGAGGGCGTTTGCCACGGT
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US-10-659- 1397  CATGGaAGTtGGCTgCACCAGAGAtAGgTtGTCTAACCcTcgGGAGGaCGcTTaCCACGGT

consensus        CATGGGAGTgGGtTtCACCAGAGAAGCAGAGTaGTcTAACCgTaaGgAGGgCGcTTgCCACGGt


US-10-659- 1442  GgGggTCATGAC TGGGGTG
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US-10-659- 1440  GAGATTCATGAC TGGGGTG
                 ||||||||||||  ||||||
US-10-659- 1439  GAGATTCATGAC TGGGGTG
                 ||||||||||||  ||||||
US-10-659- 1439  GAGATTCATGAC TGGGGTG
                 |||||||||||||  ||
US-10-659- 1453  GAGATTCATGAC TGG
                 |||||||||||||  |
US-10-659- 1457  GAGATTCATGAC TGGGGTGAAGTCGTAACAAttTA
                 ||||| ||||||  ||||||||||||||||||  ||
US-10-659- 1458  GtGgTcaATGACtTGGGGTGAAGTCGTAACAAggTAa

consensus        GaGattcATGACtTGGggtgaagtcgtaacaa--taa
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Alignment score = 7466.00

Scoring matrix:

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1		1454	1338	1300	1304	1220	1253
2			1335	1297	1303	1219	1252
3				1317	1226	1145	1177
4					1185	1111	1139
5						1304	1344
6							1450
7							

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!!NA_MULTIPLE_ALIGNMENT 1.0
PileUp of: us*

Symbol comparison table: GenRunData:pileupdna.cmp  CompCheck: 6876

            GapWeight: 5
      GapLengthWeight: 0

pileup_983.msf  MSF: 1499  Type: N   April 6, 2006 09:52  Check: 4192 ..

 Name: us-10-659-983a-1    Len: 1499  Check: 4465  Weight:  1.00
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 Name: us-10-659-983a-18   Len: 1499  Check: 2795  Weight:  1.00
 Name: us-10-659-983a-20   Len: 1499  Check: 4660  Weight:  1.00
 Name: us-10-659-983a-19   Len: 1499  Check: 3089  Weight:  1.00
 Name: us-10-659-983a-3    Len: 1499  Check: 3801  Weight:  1.00
 Name: us-10-659-983a-4    Len: 1499  Check: 1226  Weight:  1.00

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us-10-659-983a-18  ~~~ttgatca tggctcagat tgaacgctga cggcatgcct tacacatgca
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us-10-659-983a-3   attttggaca atggggcaa  acgggaaa   cccatgatcca gtgagtgaag
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1201
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1301
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OLDDISTANCES within: us* April 6, 2006 16:34

Threshold of comparison: 1
Denominator: "Length of shorter sequence"
Number of sequences: 7
Symbol Comparison Table: GenRunData:dnadistances.cmp

Key for column and row indices:

1	us-10-659-983a-1	Length: 1457	Length without gaps: 1457
2	us-10-659-983a-18	Length: 1467	Length without gaps: 1467
3	us-10-659-983a-19	Length: 1494	Length without gaps: 1494
4	us-10-659-983a-2	Length: 1457	Length without gaps: 1457
5	us-10-659-983a-20	Length: 1491	Length without gaps: 1491
6	us-10-659-983a-3	Length: 1458	Length without gaps: 1458
7	us-10-659-983a-4	Length: 1460	Length without gaps: 1460

Distance Matrix Part: 1

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2		1.0000	0.2488	0.2739	0.2447	0.2469	0.2726
3			1.0000	0.2690	0.2649	0.2785	0.2610
4				1.0000	0.2663	0.2677	0.2876
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6						1.0000	0.3258
7							1.0000

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; Sequence 1, Application US/10659983A
; GENERAL INFORMATION:
;  APPLICANT: Hovanec, Timothy A
;  TITLE OF INVENTION: Ammonia-Oxidizing Bacteria
;  FILE REFERENCE: 81289-284779
;  CURRENT APPLICATION NUMBER: US/10/659,983A
;  CURRENT FILING DATE: 2003-09-10
;  PRIOR APPLICATION NUMBER: US 09/573,684
;  PRIOR FILING DATE: 2000-05-19
;  PRIOR APPLICATION NUMBER: US 60/386,217
;  PRIOR FILING DATE: 2002-09-19
;  PRIOR APPLICATION NUMBER: US 60/386,218
;  PRIOR FILING DATE: 2002-09-19
;  PRIOR APPLICATION NUMBER: US 60/386,219
;  PRIOR FILING DATE: 2002-09-19
;  NUMBER OF SEQ ID NOS: 23
;  SOFTWARE: PatentIn version 3.2
; SEQ ID NO 1
;  LENGTH: 1457
;  TYPE: DNA
;  ORGANISM: Unknown
;  FEATURE:
;  OTHER INFORMATION: AOB Type A R7clone140 16S rDNA
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; Sequence 2, Application US/10659983A
; GENERAL INFORMATION:
;  APPLICANT: Hovanec, Timothy A
;  TITLE OF INVENTION: Ammonia-Oxidizing Bacteria
;  FILE REFERENCE: 81289-284779
;  CURRENT APPLICATION NUMBER: US/10/659,983A
;  CURRENT FILING DATE: 2003-09-10
;  PRIOR APPLICATION NUMBER: US 09/573,684
;  PRIOR FILING DATE: 2000-05-19
;  PRIOR APPLICATION NUMBER: US 60/386,217
;  PRIOR FILING DATE: 2002-09-19
;  PRIOR APPLICATION NUMBER: US 60/386,218
;  PRIOR FILING DATE: 2002-09-19
;  PRIOR APPLICATION NUMBER: US 60/386,219
;  PRIOR FILING DATE: 2002-09-19
;  NUMBER OF SEQ ID NOS: 23
;  SOFTWARE: PatentIn version 3.2
; SEQ ID NO 2
;  LENGTH: 1457
;  TYPE: DNA
;  ORGANISM: Unknown
;  FEATURE:
;  OTHER INFORMATION: AOB Type A1 R7clone187 16S rDNA
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; Sequence 3, Application US/10659983A
; GENERAL INFORMATION:
; APPLICANT: Hovanec, Timothy A
; TITLE OF INVENTION: Ammonia-Oxidizing Bacteria
; FILE REFERENCE: 81289-284779
; CURRENT APPLICATION NUMBER: US/10/659,983A
; CURRENT FILING DATE: 2003-09-10
; PRIOR APPLICATION NUMBER: US 09/573,684
; PRIOR FILING DATE: 2000-05-19
; PRIOR APPLICATION NUMBER: US 60/386,217
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,218
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,219
; PRIOR FILING DATE: 2002-09-19
; NUMBER OF SEQ ID NOS: 23
; SOFTWARE: PatentIn version 3.2
;
; SEQ ID NO 3
; LENGTH: 1458
; TYPE: DNA
; ORGANISM: Unknown
; FEATURE:
; OTHER INFORMATION: AOB Type B R3clone5 16S rDNA
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; Sequence 4, Application US/10659983A
; GENERAL INFORMATION:
; APPLICANT: Hovanec, Timothy A
; TITLE OF INVENTION: Ammonia-Oxidizing Bacteria
; FILE REFERENCE: 81289-284779
; CURRENT APPLICATION NUMBER: US/10/659,983A
; CURRENT FILING DATE: 2003-09-10
; PRIOR APPLICATION NUMBER: US 09/573,684
; PRIOR FILING DATE: 2000-05-19
; PRIOR APPLICATION NUMBER: US 60/386,217
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,218
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,219
; PRIOR FILING DATE: 2002-09-19
; NUMBER OF SEQ ID NOS: 23
; SOFTWARE: PatentIn version 3.2
;
; SEQ ID NO 4
; LENGTH: 1460
; TYPE: DNA
; ORGANISM: Unknown
; FEATURE:
; OTHER INFORMATION: AOB Type C R5clone47 16D rDNA
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; Sequence 18, Application US/10659983A
; GENERAL INFORMATION:
; APPLICANT: Hovanec, Timothy A
; TITLE OF INVENTION: Ammonia-Oxidizing Bacteria
; FILE REFERENCE: 81289-284779
; CURRENT APPLICATION NUMBER: US/10/659,983A
; CURRENT FILING DATE: 2003-09-10
; PRIOR APPLICATION NUMBER: US 09/573,684
; PRIOR FILING DATE: 2000-05-19
; PRIOR APPLICATION NUMBER: US 60/386,217
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,218
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,219
; PRIOR FILING DATE: 2002-09-19
; NUMBER OF SEQ ID NOS: 23
; SOFTWARE: PatentIn version 3.2
; SEQ ID NO 18
; LENGTH: 1467
; TYPE: DNA
; ORGANISM: Unknown
; FEATURE:
; OTHER INFORMATION: N. Aestuarii-like AOB P4clone42 16S rDNA

US-10-659-983A-18

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; Sequence 19, Application US/10659983A
; GENERAL INFORMATION:
; APPLICANT: Hovanec, Timothy A
; TITLE OF INVENTION: Ammonia-Oxidizing Bacteria
; FILE REFERENCE: 81289-284779
; CURRENT APPLICATION NUMBER: US/10/659,983A
; CURRENT FILING DATE: 2003-09-10
; PRIOR APPLICATION NUMBER: US 09/573,684
; PRIOR FILING DATE: 2000-05-19
; PRIOR APPLICATION NUMBER: US 60/386,217
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,218
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,219
; PRIOR FILING DATE: 2002-09-19
; NUMBER OF SEQ ID NOS: 23
; SOFTWARE: PatentIn version 3.2
; SEQ ID NO 19
; LENGTH: 1494
; TYPE: DNA
; ORGANISM: Unknown
; FEATURE:
; OTHER INFORMATION: N. Aestuarii-like AOB P4clone31 16S rDNA

US-10-659-983A-19

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;    Sequence 20, Application US/10659983A
;    GENERAL INFORMATION:
;  <;    APPLICANT: Hovanec, Timothy A
;  <;    TITLE OF INVENTION: Ammonia-Oxidizing Bacteria
;  <;    FILE REFERENCE: 81289-284779
;  <;    CURRENT APPLICATION NUMBER: US/10/659,983A
;  <;    CURRENT FILING DATE:  2003-09-10
;  <;    PRIOR APPLICATION NUMBER: US 09/573,684
;  <;    PRIOR FILING DATE: 2000-05-19
;  <;    PRIOR APPLICATION NUMBER: US 60/386,217
;  <;    PRIOR FILING DATE: 2002-09-19
;  <;    PRIOR APPLICATION NUMBER: US 60/386,218
;  <;    PRIOR FILING DATE: 2002-09-19
;  <;    PRIOR APPLICATION NUMBER: US 60/386,219
;  <;    PRIOR FILING DATE: 2002-09-19
;  <;    NUMBER OF SEQ ID NOS: 23
;  <;    SOFTWARE: PatentIn version 3.2
;
;    SEQ ID NO 20
;  <;    LENGTH: 1491
;  <;    TYPE: DNA
;  <;    ORGANISM: Unknown
;  <;    FEATURE:
;  <;    OTHER INFORMATION: N. Aestuarii-like AOB BF16clone57 16S rDNA

US-10-659-983A-20

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> o <
o|io   IntelliGenetics
> o <

GENALIGN - Multiple Sequence Alignment Program
Release 5.4

Thu 6 Apr 106 9:59:08-PST

Solution Parameters:

    Nucleic Alphabet    = Identity
    Output line length  = 80
    Compress            = Off
    Histogram           = Off
    Randomization       = Off

    AMINO-Res-length    = 2
    DELetion-weight     = 5.00
    LEngth-factor       = 0
    Matching-weight     = 1.00
    NUCLEIC-Res-length  = 4
    SPread-factor       = 50

Clustered order of selected sequences:

    4. US-10-659-948A-4   (1-1460)
    3. US-10-659-948A-3   (1-1458)
    1. US-10-659-948A-1   (1-1457)
    2. US-10-659-948A-2   (1-1457)
    5. US-10-659-948A-18  (1-1467)
    7. US-10-659-948A-20  (1-1491)
    6. US-10-659-948A-19  (1-1494)
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Region Alignment: (listed in Clustered order)

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US-10-659-   1                                        ATTGAACGCTGCGGCGATGCTTTACACATGCAAGTCGAACGGC
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US-10-659-   1                                        ATTGAACGCTGCGGCCATGCTTTACACATGCAAGTCGAACGGC
                                                      |||||||||||||||||||||||||||||||||||||||||||
US-10-659-   1                                        ATTGAACGCTGCGGCGATGCTTTACACATGCAAGTCGAACGGC
                                                      |||||||||||||||||||||||||||||||||||||||||||
US-10-659-   1                                        ATTGAACGCTGCGGCGATGCTTTACACATGCAAGTCGAACGGC
                                                      |||||||||||||||||||||||||||||||||||||||||||
US-10-659-   1                                        ATTGAACGCTGCGGCGATGCTTTACACATGCAAGTCGAACGGC
                                                      |||||||||||||||||||||||||||||||||||||||||||
US-10-659-   1           TTGATCATGGCTCAGATTGAACGCTGCGGCGATGCTTTACACATGCAAGTCGAACGGC
                         ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659-   1         GTTTGATCATGGCTCAGATTGAACGCTGCGGCGATGCTTTACACATGCAAGTCGAACGGC
                       ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659-   1       aGTTTGATCATGGCTCAGATTGAACGCTGCGGCGATGCTTGCGGCGATGCTTTACACATGCAAGTCGAACGGC
consensus            agtttgatcatggctcagATTGAACGCTGCGGCGATGCTGCGGCGATGCTTTACACATGCAAGTCGAACGGC

US-10-659-   44   AGCggGG    GcttcggCCTGccGGGCAGTGGCGAACGGGTGAGTAATACATCGGAACGTgT
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US-10-659-   44   AGCACGG    GggcaacCCTGGTCGGGCAGTGGCGAACGGGTGAGTAATACATCGGAACGTAT
                             |||||||||||||||||||||||||||||||||||||||||||||||
US-10-659-   44   AGCACGGATGCTTGCATCTGGTGGCGGGCAGTGGCGAACGGGTGAGTAATGCATCGGAACGTAT
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US-10-659-   44   AGCACGGATGCTTGCATCTGGTGGCGGGCAGTGGCGAACGGGTGAGTAATGCATCGGAACGTAT
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US-10-659-   59   AGCACGGGTGCTTGCTTCACCTGGTGGCGGGCAGTGGCGAACGGGTGAGTAATGCATCGGAACGTGT
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US-10-659-   61   AGCACGGGTGCTTGCTTCACCTGGTGGCGGGCAGTGGCGAACGGGTGAGTAATGCATCGGAACGTGT
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consensus           agcacgggtgcttgcttcaccTGgtGGCGGGCAGTGGCGAACGGGTGAGTAATGCATCGGAACGTGT

US-10-659-   62   AGCACGGGTGCTTGCTTCACCTGGTGGCGGGCAGTGGCGAACGGGTGAGTAATGCATCGGAACGTGT
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consensus           AGCacGGtggtgcttgcacCTtgtGGCGGGCAGTGGCGAACGGGTGAGTAATGcatCGGAACGTgt

US-10-659-   103  CcTtaAGtGGGGaATAACGCAtcCGAAAGaTGTGCTAATACCGCATA  TCTTCtgaGGAGAAA
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US-10-659-   103   CcTcgAGGGGGGATAACGCACCGAAAGgTGTGCTAATACCGCATAaTCTTCACGGAGAAA
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US-10-659-   105   CCAGAAGAGAGGGGTGGGGGTAACGCATCGAAAGATGTGCTAATACCGCATATTCTTAAGAGGAA
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US-10-659-   105   CCAGAAGAGAGGGGTGGGGGTAACGCATCGAAAGATGTGCTAATACCGCATATTCTTAAGAGGAA
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US-10-659-   120   CCAGAAGTGGGGATAACGCATCGAAAGATGTGCTAATACCGCATATTCTTACGGAGGAA
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US-10-659-   122   CCGAAGTGGGGATAACGCATCGAAAGATGTGCTAATACCGCATATTCTTACGGAGGAA
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US-10-659-   123   CCggAAGTGGGGATAACGCATCGAAAGATGTGCTAATACCGCATAttCTCacGGAGGAA
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consensus           CcagaAGtGGGgaTAACGCAtCGAAAGaTGTGCTAATACCGCATAttCTCacGGAGGAA

US-10-659-   163   AGCAGGGGATCGCAAGACCTTGCGCTaaaGGAGCGGCCGGCGATGTCTGATTAGCTAGTTGGTG
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US-10-659-   164   AGCAGGGGATCGCAAGACCTTGCGCTCTTGGAGCGGCCGGCGATGTCTGATTAGCTAGTTGGTG
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US-10-659-   166   AGCAGGGGATCGAAAGACCTTGCGCTTTGGAGCGGCCGGCGATGTCTGATTAGCTAGTTGGTG
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US-10-659-   166   AGCAGGGGATCGAAAGACCTTGCGCTTTGGAGCGGCCGGCGATGTCTGATTAGCTAGTTGGTG
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US-10-659-   181   AGCAGGGGATCGAAAGACCTTGTGCTTTGGAGCGGCCGGCGATGCCTGATTAGCTAGTTGGTG
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US-10-659-   183   AGCAGGGGATCGAAAGACCTTGTGCTTTGGAGCGGCCGGCGATGCCTGATTAGCTAGTTGGTG
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US-10-659-   184   AGCAGGGGATCGAAAGACCTTGTGCTTTGGAGCGGCCGGCGATGCCTGATTAGCTAGTTGGTG
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US-10-659-   224   gGGTAAaGGCTTACCAAGGCaACGATCAGTAGtcTGGTCTGAGAGGACGACCAaCCACACTG
                    ||||||||||||||||||||||||||||||||| |||||||||||||||||||||||||||||
US-10-659-   225   aGGTAAtGGCTTACCAAGGCaACGATCAGTAGctGGTCTGAGAGGACGACCAgCCACACTG
                    |||||| |||||||||||||||||||||||||| ||||||||||||||||||| |||||||||
US-10-659-   227   GGGTAAaGGCCTACCAAGGCGACGATCAGTAGTTGGTCTGAGAGGACGACCAGCCACACTG
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US-10-659-   227   GGGTAAaGGCCTACCAAGGCGACGATCAGTAGTTGGTCTGAGAGGACGACCAGCCACACTG
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US-10-659-   242   GGGTAAaGGCCTACCAAGGCaACGATCAGTAGTTGGTCTGAGAGGACGACCAGCCACACTG
                    ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659-   244   GGGTAAaGGCCTACCAAGGCaACGATCAGTAGTTGGTCTGAGAGGACGACCAGCCACACTG
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                    ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
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US-10-659-   285   GGACTGAGACACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGGAATTTTGGACAATGGGc
                    ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659-   286   GGACTGAGACACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGGAATTTTGGACAATGGGg
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US-10-659-   288   GGACTGAGACACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGGAATTTTGGACAATGGGC
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US-10-659-   303   GGACTGAGACACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGGAATTTTGGACAATGGGC
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US-10-659-   305   GGACTGAGACACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGGAATTTTGGACAATGGGC
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US-10-659-   306   GGACTGAGACACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGGAATTTTGGACAacGGGC
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consensus            GGACTGAGACACGGCCCAGACTCCTACGGGAGGCAGCAGTGGGGAATTTTGGACAacGGGC

US-10-659-   346   GAAAGCCTGATCCAGCCATGCCGCGTGAGTGAAGAAGGCC  TTCGGGTTGTAgAGCTCTTT
                    ||||||||||||||||||||||||||||||||||||||||  ||||||||||| |||||||||
US-10-659-   347   GAAACCCTGATCCAGCCATGCCGCGTGAGTGAAGAAGGCC  TTCGGGTTGTAAAGCTCTTT
                    |||| |||||||||||||||||||||||||||||||||||  |||||||||||||||||||||
US-10-659-   349   GCAAGCCTGATCCAGCCAATGCCGCGTGAGTGAAGAAGGCC TTCGGGTTGTAAAGCTCTTT
                    | |||||||||||||||| ||||||||||||||||||||||  ||||||||||||||||||||
US-10-659-   349   GCAAGCCTGATCCAGCCAATGCCGCGTGAGTGAAGAAGGCC TTCGGGTTGTAAAGCTCTTT
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Thu Apr 6 10:00:24 2006

Right column:

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consensus         CCTCGGAAtTGCCGTTTGAAACTACAAaGCTAGAGTGtgaGCAGAGAGGGgggTGGAATTCCACG

US-10-659-   650  TGTAGCAGTGAAATGCGTAGAGATGTGGAaGAACACCGATGGCGAAGGCAGCtCCCTGGGT
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US-10-659-   651  TGTAGCAGTGAAATGCGTAGAGATGTGGAGGAACACCGATGGCGAAGGCAGCGCCCCTGGGT
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US-10-659-   653  TGTAGCAGTGAAATGCGTAGAGATATGGAAGAACACCGATGGCGAAGGCAGCGCCCCTGGGT
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659-   653  TGTAGCAGTGAAATGCGTAGAGATATGGAAGAACACCGATGGCGAAGGCAGCGCCCCTGGGT
                  ||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
US-10-659-   667  TGTAGCAGTGAAATGCGTAGAGATATGGAAGAACACCGATGGCGAAGGCAGCGCCCCTGGGT
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US-10-659-   670  TGTAGCAGTGAAATGCGTAGAGATATGGAAGAACACCGATGGCGAAGGCAGCGCCCCTGGGT
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US-10-659-   671  TGTAGCAGTGAAATGCGTAGAGATATGGAAGAACACCGATGGCGAAGGCAGCGCCCCTGGGT
consensus         TGTAGCAGTGAAATGCGTAGAGATaTGGAaGAACAtcGATGGCGAAGGCAGCGCCCCTGGGT

US-10-659-   711  TgACActGACGCTCAtGCGAAAGCGTGGGAGCAAACGATTAGATACCCTGGTAGTC
US-10-659-   712  TAACACcGACGCTCAggCGCACGAAAGCGTGGGAGCAAACAGATTAGATACCCTGGTAGTC
US-10-659-   714  TAACACTGACGCTCATGCGAAAGCGTGGGAGCAAACAGATTAGATACCCTGGTAGTC
US-10-659-   714  TAACACTGACGCTCATGCGAAAGCGTGGGAGCAAACAGATTAGATACCCTGGTAGTC
US-10-659-   728  TAACACcGACGCTCATGCGAAAGCGTGGGAGCAAACAGATTAGATACCCTGGTAGTC
US-10-659-   731  TAACACTGACGCTCATGCGAAAGCGTGGGAGCAAACAGATTAGATACCCTGGTAGTC
US-10-659-   732  TaACActGACGCTCAtGCGACGAAAGCGTGGGAGCAAACAGGATTAGATACCCTGGTAGTC
consensus         TaACActGACGCTCAtGCGACGAAAGCGTGGGAGCAAACAGGATTAGATACCCTGGTAGTC

US-10-659-   772  CACGCCCTAAACGATGTCAACTggTGTCGCGatcTaaTcAaGGaCttGGTAACGCAGCTAA
US-10-659-   773  GTCTTAACGGACTTGGTAACGCAGCTAA
US-10-659-   775  GCCTTATTGGGCTTGGTAACGCAGCTAA
US-10-659-   775  CACGCCCTAAACGATGTCAACGATGTCAACTAGTGTTGG
US-10-659-   789  GCCTTACTAGGGCTTGGTAACGTAGCTAA
US-10-659-   792  CACGCCCTAAACGATGTCAACTAGTGTTGG
US-10-659-   793  GCCTTACTAGGGCTTGGTAACGTAGCTAA
consensus         TaACtGACGCGCTCAtGCGACGAAAGCGTGGGAGCAAACAGGATTAGATACCCTGGTAGTC

US-10-659-   833  CGCGTGAAGTTGaCCGCCGTCGGGGAGTACGGTCGCAAGATTAAAACTCAAAGGAATTGACGG
US-10-659-   832  CGCGTGAAGTTGgCCGCCGTCGGGGAGTACGGTCGCAaGATTAAAACTCAaAGGAATTGACGG
US-10-659-   834  CGCGTGAAGTTGaCCGCCGTCGGGGAGTACGGTCGCAAGATTAAAACTCAAAGGAATTGACGG
US-10-659-   834  CGCGTGAAGTTGaCCGCCGTCGGGGAGTACGGTCGCAAGATTAAAACTCAAAGGAATTGACGG
US-10-659-   848  CGCGTGAAGTTGaCCGCCGTCGGGGAGTACGGTCGCAaGATTAAAACTCAAAGGAATTGACGG
US-10-659-   851  CGCGTGAAGTTGACCGCCGTCGGGGAGTACGGTCGCGCAAGATTAAAACTCAAAGGAATTGACGG
US-10-659-   852  CGCGTGAAGTTGACCGCCGTCGGGGAGTACGGTCGCAaGATTAAAACTCAAAGGAATTGACGG
consensus         CGCGTGAAGTTGaCCGCCGTCGGGGAGTACGGTCGCAaGATTAAAACTCAAAGGAATTGACGG
```

Left column:

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US-10-659-   364  GAAAGCCTGATCCAGCAATGCCGCGTGAGTGAGGAAGAAGG   C  TTCGGGTTGTAAAGCTCTTT
US-10-659-   366  GAAAGCCTGATCCAGCAATGCCGCGTGAGTGAGGAAGAAGG   CCTTCGGGTTGTAAAGCTCTTT
US-10-659-   367  GAAAGCCTGATCCAGCAATGCCGCGTGAGTGAGGAAGAAGG   CCTTCGGGTTGTAaAGCTCTTT
consensus         GaAAgCCTGATCCAGCAATGCCGCGTGAGTGAGGAAGAAGGGCCTTCGGGTTGTAaAGCTCTTT

US-10-659-   406  tAGTCaGAAaGAAAgaaTCatGatgaAATaattaTGAtTTaTGaCGGGTACtGaCaGAAAaAAG
US-10-659-   407  CAGCCGGAAcGAAAcGTCACGCGtACGGGTAaAATAATCGTGACTacTGaCTGACCGGaAGAGAAG
US-10-659-   409  CAGTCGAGAAGAGAAAAGGTTaCGGTAaAATAATCGTGACTCATGaCGtATCGAaTCGaCaGAGAAG
US-10-659-   409  CAGTCGAGAAGAGAAAAGGTTACGGTAaAATAATCGTGACTCATGaCcGCCATGACGGTATCGAaCAGAGAAG
US-10-659-   423  CAGTCGAGAAGAGAAAAGGTTGTGACTAATTAATCACAACTTATGAtGGGTACCGAaCAGAGAAG
consensus         CAGTCGAGAAGAGAAAAGGTTGTGACTAATTAATCACAACTTATGAtGGGTACCGAaCAGAGAAG

US-10-659-   426  CAGTCGAGAAGAGAAAAGGTTGTGACTAATTAATCACAACTTATGACGGGTACCGaCAGAGAAG
US-10-659-   427  CAGTCGAGaGAaGAaGAAaggTtatGactAATTaatcatgaActtaTGaCGGGTaccGacAGAGaAAG
consensus         cAGtCgagAaGAaGAAaggTtatGactAATTaatcatgaActtaTGaCGGGTaccGacAGAGaAAG

US-10-659-   467  CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCgAGCGTTAATCGGAAT
US-10-659-   468  CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCAAGCGTTAATCGGAAT
US-10-659-   470  CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCAAGCGTTAATCGGAAT
US-10-659-   470  CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCAAGCGTTAATCGGAAT
US-10-659-   484  CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCAAGCGTTAATCGGAAT
US-10-659-   487  CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCAAGCGTTAATCGGAAT
US-10-659-   488  CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCAAGCGTTAATCGGAAT
consensus         CACCGGCTAACTACGTGCCAGCAGCCGCGGTAATACGTAGGGTGCAAGCGTTAATCGGAAT

US-10-659-   528  TACTGGGCGTAAAgGGTGCGCAGGCGGTTTCGTGAAGTCagATGTGAAAGCCCCGGGCTTAA
US-10-659-   529  TACTGGGCGTAAAGGGTGCGCAGGCGGTTTGTGAAGTCagATGTGAAAGCCCCGGGCTTAA
US-10-659-   531  TACTGGGCGTAAAGGGTGCGCAGGCGGCTTTGTGAAGTCagATGTGAAAGCCCCGGGCTTAA
US-10-659-   531  TACTGGGCGTAAAGGGTGCGCAGGCGGCCTGTTGTGAAGTCagATGTGAAAGCCCGGGCTTAA
US-10-659-   545  TACTGGGCGTAAAGGGTGCGCAGGCGGCGGCTTTGTGAAGTCagATGTGAAATCCCCGGGCTTAA
US-10-659-   548  TACTGGGCGTAAAGGGTGCGCAGGCGGCTTGTGAAGTCagATGTGAAATCCCCGGGCTTAA
US-10-659-   549  TACTGGGCGTAAAGGGTGCGCAGGCGGcctTGTGAAGTCagATGTGAAAtCCCCGGGCTTAA
consensus         TACTGGGCGTAAAGGGTGCGCAGGCGGctTGTGAAGTCagATGTGAAAtCCCCGGGCTTAA

US-10-659-   589  CCTGGGAAcTGCGTTTGAAACTACAAGGTGcagGCAGAGGGGGTGGAATTCCaTg
US-10-659-   590  CCTGGGAAcTGCGTTTGAAACTACACAAGGTGTGGCAGAGGGGGTGGAATTCCACG
US-10-659-   592  CCTGGGAATTGCGTTTGAAACTACACAAGCTGTGGCGCAGAGGGGGTGGAATTCCATG
US-10-659-   592  CCTGGGAATTGCGTTTGAAACTACACAAGCTGTGGCGCAGAGGGGGTGGAATTCCATG
US-10-659-   606  CCTGGGAATTGCGTTTGAAACTACAAAGCTAGCAGAGTGTAGAGGGGGTGGAATTCCATG
US-10-659-   609  CCTGGGAATTGCGTTTGAAACTACAAAGCTAGAGTGTAGAGGGGGTGGAATTCCATG
consensus         CCTGGGAATTGCGTTTGAAACTACAAAGCTAGAGTGTAGAGGGGGTGGAATTCCATG
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US-10-659-  894  GGACCCGCACAAGCGGTGGATTAATGTGGATTAATTCGATGCAACGCGAAAAACCTTACCTA
US-10-659-  893  |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
                 GGACCCGCACAAGCGGTGGATTAATGTGGATTAATTCGATGCAACGCGAAAAACCTTACCTA
US-10-659-  895  GGACCCGCACAAGCGGTGGATTAATGTGGATTAATTCGATGCAACGCGAAAAACCTTACCTA
US-10-659-  895  GGACCCGCACAAGCGGTGGATTAATGTGGATTAATTCGATGCAACGCGAAAAACCTTACCTA
US-10-659-  909  GGACCCGCACAAGCGGTGGATTAATGTGGATTAATTCGATGCAACGCGAAAAACCTTACCTA
US-10-659-  912  GGACCCGCACAAGCGGTGGATTAATGTGGATTAATTCGATGCAACGCGAAAAACCTTACCTA
US-10-659-  913  GGACCCGCACAAGCGGTGGATTAATGTGGATTAATTCGATGCAACGCGAAAAACCTTACCTA
consensus        GGACCCGCACAAGCGGTGGATTAATGTGGATTAATTCGATGCAACGCGAAAAACCTTACCTA

US-10-659-  955  CCCTTGACATGCttggGAAcCtaGtgGAGAcaTaaGaGTG   CCCGAAAAGGGAGCcaagACAC
US-10-659-  954  CCCTTGACATGTACCGAaGCCcGccGAGAggTggGtGTG   CCCGAAAAGGGAGCCgTAACAC
US-10-659-  956  CCCTTGACATGCTAGCGAATTTTCTAGAGATAGATTAGTG  C   TTCGGGAACGCTAACAC
US-10-659-  956  CCCTTGACATGCTAGCGAATTTTCTAGAGATAGATTAGTG  C   TTCGGGAACGCTAACAC
US-10-659-  970  CCCTTGACATGCTAGCGAATATTTTAGAGATAAATAGTGCC     TTCGGGAACGCTAACAC
US-10-659-  973  CCCTTGACATGCTAGCGAATATTTTAGAGATAAAATAGTGCC    TTCGGGAACGCTAACAC
US-10-659-  974  CCCTTGACATGCTAGCGAATATTTTAGAGATAAAATAGTGCC    TTCGGGAACGCTAACAC
consensus        CCCTTGACATGtagcGAAtatttcaGAGAtaaaataGTGCccgttcGGGAacGctaACAC

US-10-659- 1015  AGGTGCTGCATGGCTGTCGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG
US-10-659- 1014  AGGTGCTGCATGGCTGTCGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG
US-10-659- 1013  AGGTGCTGCATGGCTGTCGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG
US-10-659- 1013  AGGTGCTGCATGGCTGTCGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG
US-10-659- 1028  AGGTGCTGCATGGCTGTCGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG
US-10-659- 1031  AGGTGCTGCATGGCTGTCGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG
US-10-659- 1032  AGGTGCTGCATGGCTGTCGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG
consensus        AGGTGCTGCATGGCTGTCGTCGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGCAACGAG

US-10-659- 1076  CGCAACCCTTGTCAcTAATGCtATCATTCtAaaTGaGaCACTTTAgTGaGACTGCCGGTGA
US-10-659- 1075  CGCAACCCTTGTCATTAATTGCCATCATTC   AGTTGGGCACTTTAaTGaaACTGCCGGTGA
US-10-659- 1074  CGCAACCCTTGTCATTAATTGCCATCATT   TGGTTGGGCACTTTAATGAGACTGCCGGTGA
US-10-659- 1074  CGCAACCCTTGTCATTAATTGCCATCATT   TGGTTGGGCACTTTAATGAGACTGCCGGTGA
US-10-659- 1089  CGCAACCCTTGTCATTAATTGCCATCATT   TAGTTGGGCACTTTAATGaGACTGCCGGTGA
US-10-659- 1092  CGCAACCCTTGTCATTAATTGCCATCATT   TAGTTGGGCACTTTAATGaGACTGCCGGTGA
US-10-659- 1093  CGCAACCCTTGTCATTAATTGCCATCATTCtagtTGgGCACTTTAatGAagACTGCCGGTGA
consensus        CGCAACCCTTGTCAttAATTGCCATCATT   taGTTGGGCACTTTAAtGagACTGCCGGTGA

US-10-659- 1137  CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC
US-10-659- 1135  CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC
US-10-659- 1134  CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC
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US-10-659- 1134  |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
                 CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC
US-10-659- 1149  CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC
US-10-659- 1152  CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC
US-10-659- 1153  CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC
consensus        CAAACCGGAGGAAGGTGGGGATGACGTCAAGTCCTCATGGCCCTTATGGGTAGGGCTTCAC

US-10-659- 1198  ACGTAATACAATGGCGGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCCAATCTCAGAAA
US-10-659- 1196  ACGTAATACAATGGCGGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCTAATCTCAGAAA
US-10-659- 1195  ACGTAATACAATGGCGGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCTAATCTCAGAAA
US-10-659- 1195  ACGTAATACAATGGCGGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCTAATCTCAGAAA
US-10-659- 1210  ACGTAATACAATGGCGGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCTAATCTCAGAAA
US-10-659- 1213  ACGTAATACAATGGCGGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCTAATCTCAGAAA
US-10-659- 1214  ACGTAATACAATGGCGGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCTAATCTCAGAAA
consensus        ACGTAATACAATGGCGGTACAGAGGGTTGCCAACCCGCGAGGGGGAGCtAATCTCAGAAA

US-10-659- 1259  GCaCGTCGTAGTCGGATCGGATCGGAGTCTGCGAACTCGACTCGGAATCGCTAGTAA
US-10-659- 1257  GCGCGTCGTAGTCGGATCGGATCGGAGTCTGCGAACTCGACTCGGAATCGCTAGTAA
US-10-659- 1256  GCGCGTCGTAGTCGGATCGGATCGGAGTCTGCGAACTCGACTCGGAATCGCTAGTAA
US-10-659- 1256  GCGCGTCGTAGTCGGATCGGAtCGGAGTCTGCGAACTCGACTCGGAATCGCTAGTAA
US-10-659- 1271  GCGCGTCGTAGTCGGATCGGATCGGAGTCTGCGAACTCGACTCGGAATCGCTAGTAA
US-10-659- 1274  GCGCGTCGTAGTCGGATCGGATCGGAGTGTGCGAACTCGACTCGGAATCGCTAGTAA
US-10-659- 1275  GCGCGTCGTAGTCGGATCGGAtCGGAGTtaGCAACTCGACTCGGAATCGCTAGTAA
consensus        GCgCGTCGTAGTCGGATCGGATCGGAGTctGCAACTCGACTCGGAATCGCTAGTAA

US-10-659- 1320  TCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACAC
US-10-659- 1318  TCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACAC
US-10-659- 1317  TCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACAC
US-10-659- 1317  TCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACAC
US-10-659- 1332  TCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACAC
US-10-659- 1335  TCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACAC
US-10-659- 1336  TCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACAC
consensus        TCGCGGATCAGCATGCCGCGGTGAATACGTTCCCGGGTCTTGTACACACCGCCCGTCACAC

US-10-659- 1381  CATGGGAGTGGCTTCACCAGAAGCAGTAGTcTAACCGtaAGGAGAcGCTTGCCACGGT
US-10-659- 1379  CATGGGAGTGGGTTTCACCAGAAGCAGTAGTCTAACCGCAAGGAGGGCGCTTGCCACGGT
US-10-659- 1378  CATGGGAGTGGGTTTCACCAGAAGCAGCAGTAGTCTAACCGTAACACGGCGCTTGCCACGGT
US-10-659- 1378  CATGGGAGTGGGTTTCACCAGAAGCAGCAGTAGTCTAACCGTAACACGGCGCTTGCCACGGT
US-10-659- 1393  CATGGGAGTGGGTTTCACCAGAAGCAGTAGGATATAGTCTAACCGTAAG  AGGGCGTTGCCACGGc
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US-10-659- 1396  CATGGGAGTGGGTTTCACCAGGAAGCAGATAGTCTAACCGTAAGGAGGGCGTTTGCCACCGT
                 |||||| |||| || ||||||||||||||||||||| |  |||||  | || ||||||
US-10-659- 1397  CATGGaAGTtGGcTgCACCAGAAGCtAGgTtGTCTAACCcTcgGGAGGaCGcTTaCCACGGT

consensus        CATGGgAGTgGgTtCACCAGaAGCaGTagTcTAACCGtaaGGaGGgCGcTTgCCACGGt


US-10-659- 1442  GgGggTCATGAC TGGGGTG
                 |  |||||||| |||||||
US-10-659- 1440  GAGATTCATGAC TGGGGTG
                 |||||||||||| |||||||
US-10-659- 1439  GAGATTCATGAC TGGGGTG
                 |||||||||||| |||||||
US-10-659- 1439  GAGATTCATGAC TGGGGTG
                 |||||||||||| |||
US-10-659- 1453  GAGATTCATGAC TGG
                 |||||||||||| ||
US-10-659- 1457  GAGATTCATGAC TGGGGTGAAGTCGTAACAAtttA
                 |  |||||||| |||||||||||||||||||  ||
US-10-659- 1458  GtGgTcaATGACtTGGGGTGAAGTCGTAACAAggTAa

consensus        GaGattCATGACtTGGggtgaagtcgtaacaa--taa
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Alignment score = 7466.00

Scoring matrix:

	1	2	3	4	5	6	7
1		1454	1338	1300	1304	1220	1253
2			1335	1297	1303	1219	1252
3				1317	1226	1145	1177
4					1185	1111	1139
5						1304	1344
6							1450
7							

- - - - - - -

!!NA_MULTIPLE_ALIGNMENT 1.0
PileUp of: ub*

Symbol comparison table: GenRunData:pileupdna.cmp   CompCheck: 6876

             GapWeight: 5
       GapLengthWeight: 0

948_pileup.msf MSF: 1499 Type: N   April 6, 2006 09:59 Check: 4192 ..

Name: us-10-659-948a-1   Len: 1499   Check: 4465   Weight: 1.00
Name: us-10-659-948a-2   Len: 1499   Check: 4156   Weight: 1.00
Name: us-10-659-948a-18   Len: 1499   Check: 2795   Weight: 1.00
Name: us-10-659-948a-20   Len: 1499   Check: 4660   Weight: 1.00
Name: us-10-659-948a-19   Len: 1499   Check: 3089   Weight: 1.00
Name: us-10-659-948a-3   Len: 1499   Check: 3801   Weight: 1.00
Name: us-10-659-948a-4   Len: 1499   Check: 1226   Weight: 1.00

//

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us-10-659-948a-1      ..........  ..........  ..at  tgaacgctgt  cggcatgctt  tacacatgca
us-10-659-948a-2      ..........  ..........  ..at  tgaacgctgt  cggcatgctt  tacacatgca
us-10-659-948a-18     ...ttgatca  tggctcagat  ..........  tgaacgctgt  cggcatgctt  tacacatgca
us-10-659-948a-20     -gtttgatca  tggctcagat  ..........  tgaacgctgt  cggcatgctt  tacacatgca
us-10-659-948a-19     agtttgatca  tggctcagat  ..........  tgaacgctgt  cggcatgctt  tacacatgca
us-10-659-948a-3      ..........  ..........  ..at  tgaacgctgt  cggcatgctt  tacacatgca
us-10-659-948a-4      ..........  ..........  ..at  tgaacgctgt  cggcatgctt  tacacatgca

                                51                                            100
us-10-659-948a-1      agtcgaacgg  cagcacgggt  gcttgcatct  ggtggcggagt  ggcggacggg
us-10-659-948a-2      agtcgaacgg  cagcacgggt  gcttgcatct  ggtggcggagt  ggcggacggg
us-10-659-948a-18     agtcgaacgg  cagcacgggt  gcttgcacct  gtggccgagt  ggcggacggg
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us-10-659-948a-3      agtcgaacgg  cagcacgggg  gcaacc..ct  ggtggcggagt  ggcggacggg
us-10-659-948a-4      agtcgaacac  cag..cgggg  gctcggcct  gccggccgagt  gccggacggg

                               101                                            150
us-10-659-948a-1      tgagtaatgc  atccggaacgt  atccagaaga  atccaggag  gatcgaaag
us-10-659-948a-2      tgagtaatgc  atccggaacgt  atccagaaga  atccaaggag  gatcgaaag
us-10-659-948a-18     tgagtaatgc  atccggaacgt  gtccagaaga  ctccacgggag  gatcgaaag
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us-10-659-948a-3      tgagtaatac  atccggaacgt  atccagaaga  acttcgagg  gatcgaaag
us-10-659-948a-4      tgagtaatac  aaggggaacgt  gtcctaagt  ctcctaagt  gggaataac

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us-10-659-948a-18     atgtgctaat  accgcatatt  ctccacgggag  gaaagcaggg  gatcgaaag
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us-10-659-948a-3      ccttcgcctc  ttggagcggc  cgatgtctga  ttagctagtt  ggtggggtaa
us-10-659-948a-4      ccttcgcctc  aaggagcggc  cgatgtctga  ttagctagtt  ggtggggtaa

                               251                                            300
us-10-659-948a-1      aggcctacca  aggcgacgat  cagtagctgg  tctgagagga  cgaccagcca
us-10-659-948a-2      aggcctacca  aggcgacgat  cagtagctgg  tctgagagga  cgaccagcca
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us-10-659-948a-19     aggcctacca  aggcgacgat  cagtagttgg  tctgagagga  cgaccagcca
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us-10-659-948a-4      aggcctacca  aggcaacgat  cagtagctgg  tctgagagga  cgaccaacca
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                               301                                            350
us-10-659-948a-1      cactgggact  gagacacggc  ccagactcct  acgggaggca  gcagtgggga
us-10-659-948a-2      cactgggact  gagacacggc  ccagactcct  acgggaggca  gcagtgggga
us-10-659-948a-18     cactgggact  gagacacggc  ccagactcct  acgggaggca  gcagtgggga
us-10-659-948a-20     cactgggact  gagacacggc  ccagactcct  acgggaggca  gcagtgggga
us-10-659-948a-19     cactgggact  gagacacggc  ccagactcct  acgggaggca  gcagtgggga
us-10-659-948a-3      cactgggact  gagacacggc  ccagactcct  acgggaggca  gcagtgggga
us-10-659-948a-4      cactgggact  gagacacggc  ccagactcct  acgggaggca  gcagtgggga

                               351                                            400
us-10-659-948a-1      attttggaca  atgggcgcaa  gcctgatcca  gccatgccgc  gtgagtgaag
us-10-659-948a-2      attttggaca  atgggcgcaa  gcctgatcca  gccatgccgc  gtgagtgaag
us-10-659-948a-18     atttggaca  atgggcgaaa  gcctgatcca  gccatgccgc  gtgagtgaag
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us-10-659-948a-3      atttggaca  acgggcgaaa  gcctgatcca  gccatgccgc  gtgagtgaag
us-10-659-948a-4      attttggaca  atggggcgaaa  gcctgatcca  gccatgccgc  gtgagtgaag

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us-10-659-948a-18     aagg..cttcg  ggttgtaaag  ctcttcagt  ccagactcct  aggttgtgac
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; GENERAL INFORMATION:
; APPLICANT: Hovanec, Timothy A
; TITLE OF INVENTION: Method of Using Ammonia-Oxidizing Bacteria
; FILE REFERENCE: 81289-294309
; CURRENT APPLICATION NUMBER: US/10/659,948A
; CURRENT FILING DATE: 2003-09-10
; PRIOR APPLICATION NUMBER: US 09/573,684
; PRIOR FILING DATE: 2000-05-19
; PRIOR APPLICATION NUMBER: US 60/386,217
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,218
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,219
; PRIOR FILING DATE: 2002-09-19
; NUMBER OF SEQ ID NOS: 23
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; SEQ ID NO 1
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; Sequence 2, Application US/10659948A
; GENERAL INFORMATION:
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; TITLE OF INVENTION: Method of Using Ammonia-Oxidizing Bacteria
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; CURRENT APPLICATION NUMBER: US/10/659,948A
; CURRENT FILING DATE: 2003-09-10
; PRIOR APPLICATION NUMBER: US 09/573,684
; PRIOR FILING DATE: 2000-05-19
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Left column:

; Sequence 3, Application US/10659948A
; GENERAL INFORMATION:
; APPLICANT: Hovanec, Timothy A
; TITLE OF INVENTION: Method of Using Ammonia-Oxidizing Bacteria
; FILE REFERENCE: 81289-294309
; CURRENT APPLICATION NUMBER: US/10/659,948A
; CURRENT FILING DATE: 2003-09-10
; PRIOR APPLICATION NUMBER: US 09/573,684
; PRIOR FILING DATE: 2000-05-19
; PRIOR APPLICATION NUMBER: US 60/386,217
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,218
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,219
; PRIOR FILING DATE: 2002-09-19
; NUMBER OF SEQ ID NOS: 23
; SOFTWARE: PatentIn version 3.2
;
; SEQ ID NO 3
; LENGTH: 1458
; TYPE: DNA
; ORGANISM: Unknown
; FEATURE:
; OTHER INFORMATION: AOB Type B R3clone5 16S rDNA
US-10-659-948A-3

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Right column:

; Sequence 4, Application US/10659948A
; GENERAL INFORMATION:
; APPLICANT: Hovanec, Timothy A
; TITLE OF INVENTION: Method of Using Ammonia-Oxidizing Bacteria
; FILE REFERENCE: 81289-294309
; CURRENT APPLICATION NUMBER: US/10/659,948A
; CURRENT FILING DATE: 2003-09-10
; PRIOR APPLICATION NUMBER: US 09/573,684
; PRIOR FILING DATE: 2000-05-19
; PRIOR APPLICATION NUMBER: US 60/386,217
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,218
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,219
; PRIOR FILING DATE: 2002-09-19
; NUMBER OF SEQ ID NOS: 23
; SOFTWARE: PatentIn version 3.2
;
; SEQ ID NO 4
; LENGTH: 1460
; TYPE: DNA
; ORGANISM: Unknown
; FEATURE:
; OTHER INFORMATION: AOB Type C R5clone47 16S rDNA
US-10-659-948A-4

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; Sequence 18, Application US/10659948A
; GENERAL INFORMATION:
; APPLICANT: Hovanec, Timothy A
; TITLE OF INVENTION: Method of Using Ammonia-Oxidizing Bacteria
; FILE REFERENCE: 81289-294309
; CURRENT APPLICATION NUMBER: US/10/659,948A
; CURRENT FILING DATE: 2003-09-10
; PRIOR APPLICATION NUMBER: US 09/573,684
; PRIOR FILING DATE: 2000-05-19
; PRIOR APPLICATION NUMBER: US 60/386,217
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,218
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,219
; PRIOR FILING DATE: 2002-09-19
; NUMBER OF SEQ ID NOS: 23
; SOFTWARE: PatentIn version 3.2
; SEQ ID NO 18
;   LENGTH: 1467
;   TYPE: DNA
;   ORGANISM: Unknown
;   FEATURE:
;   OTHER INFORMATION: N. Aestuarii-like AOB P4clone42 16S rDNA
US-10-659-948A-18
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; Sequence 19, Application US/10659948A
; GENERAL INFORMATION:
; APPLICANT: Hovanec, Timothy A
; TITLE OF INVENTION: Method of Using Ammonia-Oxidizing Bacteria
; FILE REFERENCE: 81289-294309
; CURRENT APPLICATION NUMBER: US/10/659,948A
; CURRENT FILING DATE: 2003-09-10
; PRIOR APPLICATION NUMBER: US 09/573,684
; PRIOR FILING DATE: 2000-05-19
; PRIOR APPLICATION NUMBER: US 60/386,217
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,218
; PRIOR FILING DATE: 2002-09-19
; PRIOR APPLICATION NUMBER: US 60/386,219
; PRIOR FILING DATE: 2002-09-19
; NUMBER OF SEQ ID NOS: 23
; SOFTWARE: PatentIn version 3.2
; SEQ ID NO 19
;   LENGTH: 1494
;   TYPE: DNA
;   ORGANISM: Unknown
;   FEATURE:
;   OTHER INFORMATION: N. Aestuarii-like AOB P4clone31 16S rDNA
US-10-659-948A-19
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;  Sequence 20, Application US/10659948A
;  GENERAL INFORMATION:
;  APPLICANT: Hovanec, Timothy A
;  TITLE OF INVENTION: Method of Using Ammonia-Oxidizing Bacteria
;  FILE REFERENCE: 81289-294309
;  CURRENT APPLICATION NUMBER: US/10/659,948A
;  CURRENT FILING DATE: 2003-09-10
;  PRIOR APPLICATION NUMBER: US 09/573,684
;  PRIOR FILING DATE: 2000-05-19
;  PRIOR APPLICATION NUMBER: US 60/386,217
;  PRIOR FILING DATE: 2002-09-19
;  PRIOR APPLICATION NUMBER: US 60/386,218
;  PRIOR FILING DATE: 2002-09-19
;  PRIOR APPLICATION NUMBER: US 60/386,219
;  PRIOR FILING DATE: 2002-09-19
;  NUMBER OF SEQ ID NOS: 23
;  SOFTWARE: PatentIn version 3.2
;  SEQ ID NO 20
;    LENGTH: 1491
;    TYPE: DNA
;    ORGANISM: Unknown
;    FEATURE:
;    OTHER INFORMATION: N. Aestuarii-like AOB BF16clone57 16S rDNA

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